

鉄道と社会

大塚いわお

RAILWAY AND SOCIETY

Iwao Otsuka

Table of Contents

[illegible]
[illegible]

[illegible]

[illegible]

[illegible]Youtube[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 1 [illegible] 1 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]

[illegible] [illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible] [illegible]

[illegible]
[illegible]

[illegible]
[illegible]

[illegible] [illegible]

[illegible]
[illegible]

[illegible] [illegible]

[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]→[illegible]

[illegible]

[illegible]

[illegible]JR[illegible]

[illegible]

[illegible]

[illegible]※[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

			[illegible]							[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	◎	△	△	[illegible]	×	[illegible]	◎	×	×	×	×
[illegible]	[illegible]	[illegible]	[illegible]	×	×	[illegible]	△	[illegible]	[illegible]	△	△	×	×
[illegible]	[illegible]	[illegible]	◎	△	△	[illegible]	[illegible]	◎	×	[illegible]	[illegible]	△	×
[illegible]	[illegible]	[illegible]	△	△	△	[illegible]	◎	×	×	◎	◎	◎	◎
[illegible]	[illegible]	[illegible]	×	×	×	[illegible]	◎	△	△	◎	◎	◎	◎
[illegible]	[illegible]	[illegible]	×	△	△	△	△	×	△	◎	△	[illegible]	◎
[illegible]	[illegible]	[illegible]	×	△	△	△	△	×	△	◎	△	[illegible]	◎
[illegible]	[illegible]	[illegible]	△	[illegible]	[illegible]	△	△	[illegible]	[illegible]	[illegible]	△	△	[illegible]
[illegible]	[illegible]	[illegible]	×	×	×	×	△	×	×	△	△	△	[illegible]

[illegible] [illegible]

[illegible]

[illegible]→[illegible]3[illegible]3[illegible]1[illegible]→[illegible]

[illegible]→[illegible]

[illegible]

[illegible]→[illegible]

[illegible]

[illegible]

[illegible]

[illegible]→[illegible]

[illegible]※[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]→[illegible]

[illegible]

[illegible] [illegible]

[illegible]→[illegible]
[illegible]1[illegible]1[illegible]1[illegible]

[illegible]

[illegible]→[illegible]→[illegible]

[illegible]

[illegible]　[illegible]

[illegible]

[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		◎	×	◎
[illegible]	[illegible]	[illegible]		◎	△	◎
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	×
[illegible]	[illegible]	[illegible]		×	◎	×
[illegible]	[illegible]	[illegible]		×	◎	[illegible]
[illegible]	[illegible]	[illegible]		×	[illegible]	△
[illegible]	[illegible]	[illegible]		×	[illegible]	△
[illegible]	[illegible]	[illegible]		[illegible]	△	[illegible]
[illegible]	[illegible]	[illegible]		×	△	×

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]3[illegible]1[illegible]1[illegible]
[illegible]
[illegible]→[illegible]

[illegible]
[illegible]
[illegible]
[illegible]→[illegible]

[illegible]
[illegible]
[illegible]→[illegible]
[illegible]

[illegible]　[illegible]

[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

[illegible]　[illegible]

[illegible]
[illegible]

Railway and society

Iwao Otsuka

Analysis of Railroad Interests

Features of Japanese railway fans and railway enthusiasts

I read a lot of remarks and videos posted by railway fans and railway enthusiasts in Japan on Twitter, Youtube, and 5chan boards, and analyzed the characteristics of their social behavior in my own way, comparing them to the current state of Japanese society. I think the same trend is likely to be seen in non-railways, such as buses, roads, and dams.

(1) They make an authoritarian psychological reliance on the railroad company and railroad equipment. They place an absolute, sacred view on the existence of railroad equipment. The sentiment is similar to the Japanese people's feelings of dependence on Japan and the emperor system. They perceive the railroad as a state-owned, semi-state-owned, and state-controlled entity. In Japan, JR and its predecessors were state-owned for a long time, and private railroads need a permit from the government to be built. They consider Japanese railways to be the key to the survival of Japanese society, especially in metropolitan areas such as the Tokyo metropolitan area and the Keihanshin area, recognize their national importance, and feel great social authority in the existence of railways. They unconsciously worship railroad equipment by treating it as a psychological superior. They are psychologically dependent on the existence of the railroad. For them, the railroad is their emotional support. For them, the railroad has become a substitute for their country and their master.
(2) They take for granted the perpetuity of railroad facilities and their historical survival. They mentally and psychologically rely on the existence and trends of railroad companies, equipment, and rolling stock as an unbroken precedent that will remain in history forever. Believing in the permanence of railways and their historic sites, they earnestly photograph and collect railway photographs, railway videos, timetables, tickets, and models, or they earnestly preserve them for a long time in their own hands, or they are absorbed in searching for and confirming the current status of abandoned railway tracks.
(3) They personify the railroad equipment. They treat it as an object of psychological empathy, like a railroad car or a being with some kind of human feelings. They value the railroad equipment and the life of the railroad car. They relentlessly follow the rise and fall and misfortune of the cars from their introduction to their transfer, to their abolition, and they have a strong sense of sympathy and empathy for those fates. They feel a sense of gratitude for all the years of work they've put in on the scrapped cars and obsolete lines. They are psychologically attached to anthropomorphic railroad characters, such as the virtual female station attendants and drivers set up mainly by railway companies. There is a huge gap between their feelings of seeking such warmth and their sense of reality as a cold physical being, a railway facility and a rolling stock.
(4) They see the person in charge of operating the railroad equipment and rolling stock as a part and parcel of the railroad equipment and rolling stock, integrated with the railroad equipment and rolling stock. They psychologically identify with the vehicle and see it as a part of the vehicle or facility, for example, the driver of a railroad car. Unlike the frantic mosaics on the reflection of the faces of ordinary passengers, they openly photograph independent personalities and privacy without much recognition. They even openly shoot station staff, trying to see them as some component of the station's equipment.
(5) They have a strong sense of psychological unity with the railroad company. They try to

think about the survival of the railway company itself from the standpoint of the station staff and employees. They try so hard to make the railroad company managerial pretensions. They love to critique and criticize the incompetence of the current management, operation, and operating orders, while they would have done it themselves. They think that they have become an employee of a railroad company in charge of operations and operations. While they are superficially critical of the railroad company's operations, they are in fact a strong support group for the railroad company's operations. They view the existence of the railroad business in a completely positive light. They continue to have a psychological closeness, a camaraderie, like a friend to the railroad company and railroad equipment. They treat railroad companies and rolling stock as their own, and often confuse public and private matters and break into their facilities for their own personal photos and other purposes. It has a similar mindset to the Japanese right, which has become a cheerleading squad for the Japanese nation and is psychologically united with it.

(6) They are masculine in their thinking, in their interest in railroad equipment, railcars and their operating systems as cold, hard physical beings operating at high speed and systematically, an extension and continuation of the boy's interest. Part of this is their enthusiasm for the game of driving railway cars and model railway driving. These male fans are not good at interpersonal relations in Japanese society, which is driven by the social norm of women's society, which places the highest priority on interpersonal relations, or they lack the feminine point of view to move according to the interests and preferences of women who are more interested in people than machines and systems, which is the mainstream presence in Japanese society, which has traditionally been very settlement-oriented. This is why railroad fans in Japan tend to be socially scorned and dismissed as railroad geeks in Japanese society. Female railroad fans have different characteristics from male fans, such as a minor interest in railroading among women and a slow increase in their numbers, or an interest in relaxing in the carriages and the living environment, or an interest in station bento, specialties and famous places along the line, or an interest in station shopping, dining facilities and the environment. Alternatively, female fans are more likely to be the idols and princesses of male fans who are less likely to speak directly to women. This has something to do with the inherent masculinity of the railroad's existence, which tends to be more interested in the operation of machines and systems than in man himself.

(7) They have a complete collecting habit over a hobby. They are perfectly recording-oriented when it comes to hobby data and objects. They try to get a full ride on every railroad line in Japan. They memorize all the cars of a particular railway company without fail. They recorded the complete starting melody of the station on a particular railway line. They try to take complete motion pictures of all the operating sections of that train or line, without omissions, by photographing the train windows and front views. They try to perfect the composition of the railroad photos they take. They try to collect all of a particular series of model trains without fail.

(8) They focus solely on and rely on the precedent of their hobby. They flaunt the amount, detail, and accuracy of their knowledge of rolling stock and train schedules in the past, or the interestingness of their knowledge as trivia that only those in the know. For them, there were already many potential candidates for railway photography locations and photographic compositions, so it was practically a precedent or tradition that they all adopted it. For them, there is a predetermined train schedule for each train line, and they all act accordingly. Some of them are hobbyists who have accumulated a lot of precedent data on the historical background of railway lines and trains and the transfer of rolling stock through their own photography and other independent reporting. They flaunt their accumulation of railway parts, models, tickets, and goods that they have collected so far. They show off the photos and videos they have taken in the past of trains and sections of the line they can no longer board now. They rely on a format that mimics the way existing television programs are structured in their railroad video shoots.

(9) They show off their power to those around them by performing and clearing the difficult tasks of their hobbies, trying to get attention. They admire or are jealous of the flaunted results of such others. They want to be noticed, admired, look good, look chic, or earn high viewership and advertising revenue by carrying out travel planning, photography, and video shooting, which are difficult in terms of economy, time, and energy. For them, all railway photographs have the same shooting location and composition, so the quality of the photograph is determined by the performance and price of the camera, and only the rich take good railway photographs. They ride on trains and lines that are difficult to schedule because they are the first to open, run one early morning a day, run in remote areas, or have rare cars. They take a train or a section of a line that costs a lot of money to ride, like a sleeper express, a green car, or an overseas train, and they film it and show it off to the people around them. They show off their time and their ability to keep up the spirit of filming by filming all the windows and front views of the train, which takes a long time to get on and off. They document and introduce to their surroundings the hidden railway facilities that are too far away or too inconvenient for ordinary people to reach, such as unexplored lines and unexplored stations. They flaunt their high social standing and advantage by recording and publishing photos and videos of things that are difficult to do unless you are rich or have a lot of time.
(10) They are knowledgeable about the geography and the latest developments in transportation and travel for rail use. They are very good at looking at and utilizing maps. They are familiar with the existence of sightseeing spots, famous places, scenic spots, and sacred anime sites in each region, and they are often absorbed in planning trips, visiting, and exploring new places to visit. They are accustomed to staying in hotels and inns and eating at the eateries they travel to and have a wealth of local travel information. They are well versed in travel routes, transit routes, and commuting and commuting routes. They are familiar with transfer information. They are well versed in non-rail transportation and road conditions.

Features, advantages and disadvantages of railways

1. Evaluate public transport

1.1 What is transportation?

It is a person who embodies social functions that realize the movement and distribution of people. It is a mechanism that allows people and things to move freely in physical and geographical space.

1.2 Specific social functions of transportation

(1) Revitalize the economy by moving people and things around
(realizing the creation of social wealth by being able to respond to the needs of distant people) (2) Maintaining and developing urban and urban functions (Realization of mass transfer of people to the city center by commuter train)
(3) Maintenance and development of living in the residential area (simplification and speeding up
access to hospitals and retail stores) (4) New knowledge and cultural Creation of a new

culture with the provision of encounters (generation of human and physical trade and realization of new knowledge
) Simplicity and speed of arrival)

1.3 Types of transportation provided by transportation

(1-1) Periodical fixed section travel (commuting, commuting)
(1-2) One-time travel (travel, one-way ticket transfer)

(2-1) Short-distance travel (commuting, shopping)
(2-2)) Long distance travel (long distance commuting, business trip, travel)

1.4 What is public transportation?

Public transportation that is open to anyone. You can ride without having private driving equipment (private car, private jet).

1.5 Advantages Common to Public Transport

(1-1) Passengers and travelers do not need to drive. You don't have to do anything if you sit on it. Passengers can concentrate on their original thinking other than driving. You can drink alcoholic beverages. Competition with self-driving cars.
(1-2) Supports long-distance batch transportation (can be communicated between distant bases such as Tokyo-Nagoya-Osaka with the number of passengers in a set).
(1-3) Easy support for temporary visitor transportation. It is not necessary for the traveler to bring back the driving ornaments (such as a private car) to the original place. This is why trains and buses are needed in rural areas of the car society.
(1-4) When a user goes somewhere, it is not necessary to have transport equipment (private car or the like) on his own. Economically easy. There is no tax on transport equipment.

(2-1) Regular use possibility. Repeated use of the same section at the same time. Commuting, school use. It is possible to ride a predetermined section every day-on a regular basis and on a regular basis.
(2-2) Unscheduled availability. One-time use at indefinite time of indefinite section. Travel, business trip use. It is possible to ride different destinations on different dates at different times.

1.6 Disadvantages and problems common to public transportation

(1-1) Limits and restrictions on the number of drivers (limits on the number of vehicles; limits on the number of tracks and roads; limits on vehicle exchange facilities and garages). Occurrence of usage wait time. The need for passengers to use timetables.
(1-2) Necessity of creating an operation diagram. Necessity of operation management command system (signal, communication equipment, etc.). → It becomes necessary to make a schedule and schedule for boarding. Promote the emergence of a scheduled society. Watches become more important.
(2-1) Necessity of user space movement. The need for physical movement. Communication

that does not require physical movement, competition with the net. Competition with a method that relies on logistics (home delivery) (users do not move and third parties move goods to trucks by users).
(2-2) It is necessary for a traveler to go to the nearest station, terminal, or stop with luggage.
(3) The need for a temporary ride with a stranger. Crime danger (molest, theft, violence). Acceptable need for the presence of unpleasant passengers (crying babies).
(4) If you get on the train, you will not be able to get off for a certain amount of time (Odakyu Line Rapid Express, JR Tokaido Line Commuter Rapid Tragedy). It is difficult to correct if you make a wrong ride (passenger on Atami who got on the Nozomi Tokaido Shinkansen). I cannot go to the toilet (commuter train, route bus).
(5) Riding error occurred. Since there are complicated driving types and routes, a situation occurs in which it is difficult to know which vehicle to ride.
(6) The upper limit of the number of seats and the occurrence of unseat passengers. Standing and fatigue of passengers. Occurrence of passengers who cannot get on (leftover, full seat reservation).
(7) Insufficient transportation capacity and the occurrence of packed vehicles. Congestion (* Occurs even on railways (during the morning rush hour, Keio Line dumpling operation)). Passenger fatigue, stress, negative incidents (such as molesting, arguing, etc.).
(8) Severity of income and expenditure, profitability (it is difficult for a deficit management).

1.7 Future prospects of public transportation

(1) Respond to declining birthrate and population decline. Depopulated, marginalized villages disappear, life is too small to sustain and can no longer be maintained. Immigration to places where transportation is more convenient to some extent, and population concentration is increasing. Manpower is reduced. Only places where a certain number of workers can be secured are preferred. It is necessary to create a place where people can gather and attract people (such as convenient living, high wages, and sufficient living without special activities). It is necessary to improve the accessibility of places where people want to migrate. These compete with self-driving private cars.

(2) Respond to aging. Elderly people are unable to walk because their legs are weak. Elderly people suffer from poor eyes and ears or dull reflexes, making it impossible to drive manually-operated vehicles. Elderly people try to live in places where the convenience of public transportation is substantial (many driving hours, short driving intervals, etc.). Elderly people try to live near stations and stops where they do not have to walk much. Elderly people try to live in flat areas where they do not have to go uphill. Elderly people are more likely to have physical injuries that are more noticeable and more accessible to hospitals. Demand for public transportation increases. Public transportation is not preferred (not used) unless it is more than convenient. Develop traffic measures targeting the elderly (i.e., relocating the elderly to flat areas near the station, securing a certain number of drivers, securing direct transportation to hospitals, etc.). These compete with self-driving private cars. Alternatively, it competes with nursing homes and courier services that can provide the elderly with their own life without leaving the elderly.

(3) Competition with self-driving cars-scooters and motorbikes will occur. Existing railroads may suffer as society begins to create optimal urban and employment forms for autonomous vehicles.
(4) Competition between electric vehicles and electric motorcycles (the cost of driving (fuel

consumption) is lower than that of fuel vehicles. Safety is higher because fuel is not used directly).

2. Evaluate railway

Pros and cons, future prospects

2.1 Passenger railway

2.1.1 Evaluation list between passenger transportation

Comparison with buses, private cars, etc.

			A. Public transport							
number	**Evaluation item**	**Evaluation criteria**	**Railway**	**Cable car**	**Ropeway**	**bus**	**taxi**	**aircraft**	**Ship**	**Auto dr priv**
1	Large number of passengers that can be carried at one time	The more, the more OK	◎	△	△	□	×	□	◎	×
2	Distance that can be carried at once	The longer the OK	□	×	×	□	△	□	□	△
3	Speed that can be carried	The faster the OK	◎	△	△	□	□	◎	×	□
4	The proximity of the starting point, stop, and end point of transportation to the desired point of the	The closer the OK	△	△	△	□	◎	×	×	◎

2.1.2 Advantages of Passenger Railway

(1) Possibility of mass transportation.
(1-1) High-density operation compatibility. Easy loading of passengers in vehicles. → Enable the generation and maintenance of overcrowded cities and city centers.
(1-2) Support for long trains (normal operation with three or more cars connected (limited to three cars on a bus). Single driver can control long trains at once. Mass transportation

possible (automatic driving and competition with the same destination by multiple vehicles) → Enable the existence of large-scale facilities (schools, domes, etc.).

(2) Possibility of securing a dedicated road. Easy to maintain pure blood of running vehicles. It is possible to suppress lane interruption and lane running caused by hybrid vehicles (not possible for buses running on general roads). It is easy to pre-read the operation status (only a fixed vehicle enters at a fixed time). It is easy to ensure regular operation. → It is possible to set minute-by-minute schedules in society.

(3) Possibility of high-speed ground movement (existing Shinkansen and Linear Shinkansen). High-speed mass transportation is possible (combined with mass transportation possibility).
(4) The necessity of steering in the driving direction when driving (the driver's psychological and physical burden during driving is small). Easy driving safety (high safety. Accidents are less likely to occur than cars). Ease of driving (existence of automatic train control device, automatic train stop device, etc.). → Necessity of accurate switching of track points, signals, etc. (Dependence on accurate and normal operation of the transportation command system).
(5) Energy saving during operation and low load on the environment (such as supplying electricity on electrified routes with hydroelectric power).

2.1.3 Shortcomings and problems of passenger railways

(1) Travelers, luggage disembarkation (at the boarding point) and the need to transfer (unfavorable compared to airport limousine buses, which take you to your final destination without transfer). It is necessary for passengers to make an itinerary (transfer schedule, etc.) (in the case of sightseeing, it may be possible to outsource the itinerary planning to a travel agency). They will not take you to your final destination (only to the nearest station). Must be used on foot or in combination with other means of transportation (bus, taxi).

(2) Restrictions on the number of lanes and tracks. Mistake of vehicles, necessity of evacuation (misplacement on a single track line, passing an ordinary train by an express train). → Unnecessary waiting time is created temporarily.
(3) Pre-determined boarding stations and stations are required. You cannot freely get on and off anywhere (buses have free sections depending on the section). Same as long distance escalator. Once you get on, you will not be able to get off to the next platform and you will be taken forcibly.
(4) The inevitable occurrence of the terminal (it cannot go beyond here, and a dead end point of the track necessarily occurs). Where you can go is decided in advance. Problem solving by expanding the cart rain. * In the case of a loop line, all stations are treated as terminals (because you cannot go outside the loop line).
(5) Inability to warp. The route is not bendable and inflexible. It is difficult to make a detour when there is no traffic due to an accident or disaster. If there are no parallel roads and parallel routes, the island will become a land island.

(6) Deterioration of the system due to operation and the necessity of continuous self-maintenance inspection and repair (daily maintenance and inspection of tracks, overhead lines, etc., and track maintenance are required).

(7) It is necessary for operators to prepare their own operating facilities (the roads are

prepared by the national or prefectural governments). Operational equipment preparation-Severity of income and expenditure due to maintenance costs (the number of passengers is required to be more than a certain number compared to buses etc.).
(8) Prolonging the time required for recovery in the event of an accident or disaster (since the equipment is on its own, it must be recovered on its own).

(9) Since the track is fixed, an intruder on the track cannot be avoided. Humans, vehicles, etc. enter, fall, jump into the track, and accidents occur. Operational irregularities, delays, and interruptions occur.
(10) It is difficult to cope with physically steep gradients and sharp curves (small buses are relatively easy).

(11) It is difficult to convert the equipment to other uses or other destinations (uneconomical). Disused line equipment is easily left as it is → It is easy to remain as a historical heritage (disused line trace).

(12) Create excessive centralized concentration in the city center. To expand the power of the railway company, it is easy for the railway company to raise the bloodway to shorten the time required for transportation to the city center and increase the number of transportation personnel to the city center (relieving congestion) with the aim of further mass high-speed transportation. Railroads have further promoted the concentration of people and goods in the city center. Even if the degree of concentration becomes excessive and the stuffing reaches the limit, it does not try to stop concentration. Increase social damage when the city center collapses due to an earthquake or an attack by another country. It is necessary to consider ways to utilize railways other than promoting central concentration in the city center.

2.1.4 Future prospects of passenger railway

(1) Competition with autonomous driving of private cars (autonomous driving cars have greater freedom in terms of destination and time, and take them to their destinations while sitting, so they consume the demand for railroads as they are) → It is necessary to consider the link between the autonomous driving car and the railway.
(2) Automatic driving and competition for the same to similar destinations in a plurality of vehicles. By attaching an autonomous driving function to each minicar and enabling cooperative operation of multiple minicars, it is not necessary to use a transportation method in which multiple people are packed in one car such as a railway car. It is necessary to devise on the railway side so that the cart train system, in which a minicar is carried on a railway car, is more efficient.

(3) With the further development of communication and logistics, access to business bases (computer cloud) and procurement of supplies necessary for business (use of courier services) become easier while staying at home. → Elimination of the need to gather live human beings in the same place (business base). → Eliminates the need to send large numbers of commuters to the city center at once. It will reduce the concentration of cities (the degree of concentration in the city center) and promote the proximity of work and residence in the suburbs. The status of the passenger railway as a means of commuting will decline. Railway companies need to consider measures such as switching to mass transportation between long-distance bases.

2.2. Freight railway

2.2.1 List of evaluations between freight transportation

Comparison with trucks and ships

number	Evaluation item	Evaluation criteria	Railway	truck	Ship
1	Lots of luggage that can be carried at one time	The more, the more OK	◎	×	◎
2	Distance that can be carried at once	The longer the OK	◎	△	◎
3	Speed that can be carried	The faster the OK	[illegible]	[illegible]	×
4	The proximity of the starting point, stop, and end point of transportation to the desired point of the	The closer the OK	×	◎	×

2.2.2 Advantages of Freight Railway

(Almost in common with the advantages of passenger railways)

(1) Possibility of mass transportation.
(1-1) High-density operation compatibility. Easy to pack luggage (container) into the vehicle.
(1-2) Support for long trains (Normal operation is possible by connecting three or more cars. One truck can be used. Batch control of long trains is possible with one driver. Possible (automatic driving and competition with the same destination in multiple vehicles) → Enable the existence of large-scale facilities (warehouses, etc.).

(2) Availability of dedicated containers. No need to mix up with other people's luggage. Easy management of luggage status and quality.
(3) Possibility of securing a dedicated road. Easy to maintain pure blood of running vehicles. It is possible to suppress lane interruption and lane running caused by hybrid vehicles (not for trucks running on general roads). It is easy to pre-read the operation status (only a fixed vehicle enters at a fixed time). It is easy to ensure regular operation. → It is possible to set minute-by-minute schedules in society.

(4) Possibility of high-speed movement on the ground (possibility of diverting existing Shinkansen cargo by opening the Linear Shinkansen).
(5) No need to steer the driving direction during driving. Easy driving safety (high safety. Accidents are less likely to occur than cars). Ease of driving. → Necessity of accurate switching of track points, signals, etc.
(6) Energy saving during operation and low load on the environment (e.g., electricity on

electrified routes can be provided by hydroelectric power).

2.2.3 Disadvantages and problems of freight railways

(1) Luggage must be brought to the nearest station or terminal (not required for trucks).
(2) Do not take you to your final destination (only to the nearest station). Need to use with other transportation (truck). You need to reload your luggage (a truck can often go directly to your final destination).
(3) Prolonging the time required for recovery in the event of an accident or disaster (since the equipment is on its own, it must be recovered on its own). It is difficult to find an alternative means of transportation during road trips other than road driving by truck (truck is more flexible and easier to use from the beginning).

2.2.4 Future prospects

(1) Possibility of transporting electric vehicles by rail (because the drive is electric instead of fuel, it is safe to load it as cargo on a freight train). The realization of cart rain becomes possible.